

1812



1926

Economic Conditions  
Governmental Finance  
United States Securities

New York, December, 1926.

### General Business Conditions

**T**HE developments of the past month have given further evidence of slight variations in the trend of business. The level of trade and industry continues high, but the constant attainment of new high records, which characterized business during the earlier months of the year, is no longer the striking feature of the situation. Considerable comment has been excited by the fact that statistical records are not showing the usual autumnal gains and in some instances show recent returns not quite up to the corresponding figures for last year.

It may be said at once that the record of the last quarter of last year is a hard one to beat or equal, and that a moderate decline from it in some lines would have no great significance. Moreover, the flow in business is not an unvarying one. The business situation does not exactly repeat itself from year to year, but is affected by weather conditions and various influences, with the result that comparisons between the same months of different years must be made with allowances. Fluctuations occur in the various branches of industry even where the sum of their activities remains unchanged. Symptoms of declining trade have aroused apprehensions several times in the past three years without developing into any serious depression.

#### Stability of Distributed Prosperity

Two things chiefly have contributed to the expansion of industry over the past few years, —the making up of the normal peace time growth that was retarded by the war, and a great increase in industrial efficiency, which has produced a wider distribution of wealth here than anywhere else and given to the mass of the people a buying power greater than that of any other country. While the impetus derived from the first may be losing its force, that derived from the second is inexhaustible so long as all parties who have contributed to that efficiency continue to do so and to cooperate reasonably well to that end. The wants of the American people are no nearer to being satisfied now than they were a year ago or

five years ago, nor is there the slightest prospect that they will be satisfied in the near future. The buying power of the American people exists in the work they do for each other from day to day, and is as limitless as their wants. The pace at which they make headway in satisfying their own and each other's wants depends upon their ability to work together harmoniously, understanding all the time the cooperative character of their relations. The secret of continued prosperity is in a fair and even distribution of it. Whenever a group attempts to get more than its share the entire flow is imperilled.

Holiday trade will dominate the remainder of 1926, but the industries will enter 1927 under a strong momentum, with cautious optimism, and with absolutely no danger of a sudden breakdown. Nobody has a right to expect that business will go continually at top speed, and none but marginal speculators of the most reckless type makes calculations upon its doing so. On the other hand, when the general course of business has been as clearly along conservative lines as has been the case since 1920 there is reason for confidence that any decline will be of a moderate and temporary character.

#### Business Active in Spite of Cross Currents

Bank checks drawn and cashed throughout the country comprise perhaps the best known index of the trade volume, and these have lately tended to fall below 1925 levels, after a record of practically unbroken gains in previous months. The following table comparing the "bank debits" for the four weeks ended November 17 and for the year to date in both 1925 and 1926, shows how the figures have been going by districts, and indicates that the losses have been fairly general throughout the country. It is significant, however, that they have been largest in the New York district, where speculative and money market operations are an indeterminate factor, and in the Atlanta district, where the figures last year were abnormally swelled by the real estate boom in Florida.

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## BANK DEBITS IN 1925 AND 1926 COMPARED

	Per Cent Change 1st 10 Months Over 1925	Per Cent Change 4 Weeks ended Nov. 17 Over 1925
Boston .....	+ 8.0	- 2.0
New York .....	+ 9.4	- 8.3
Philadelphia .....	+ 3.8	+ 1.5
Cleveland .....	+ 4.7	- 2.6
Richmond .....	+ 2.4	- 0.8
Atlanta .....	+ 5.0	-11.4
Chicago .....	+ 6.2	+ 0.6
St. Louis .....	+ 3.6	0.0
Minneapolis .....	+ 7.7	- 5.0
Kansas City .....	+ 5.0	+ 5.0
Dallas .....	+ 2.6	- 2.0
San Francisco .....	+10.6	- 0.4
All Districts .....	+ 7.7	- 5.0

New York State factory employment, while continuing at high levels during October, likewise failed to measure up to the still better levels of a year ago. New building projects throughout the country continue to run slightly under 1925, while the automobile industry gives evidence of more than ordinary seasonal curtailment, which has carried production considerably under that of a year ago. In a scattering of other lines, also including mail order and department store business, and new life insurance written, the October figures fell below those of a year ago.

Evidences, however, such as these of cross currents in business following a long period of activity should be noted for further attention rather than taken too literally. Bank clearings, it has to be remembered, are expressed in dollars, and wholesale prices are approximately 5 per cent lower than a year ago. Moreover, the figures include not only commercial transactions but also speculative operations, which are probably less widespread than a year ago. Retail trade was badly handicapped all over the country during October by unseasonably warm weather, while as to employment figures it is doubtful whether the New York State report is typical, failing as it does to reflect the greatly increased activity in coal mining and textile manufacturing.

Contrasting with the bank clearings, railway traffic continues to break all records for the season. During the last week of October the car loadings, numbering 1,216,432, broke all records for all time, while those for the first two weeks of November, though under the seasonal peak, were 6 per cent greater than those in the corresponding period a year ago. Featuring the figures were the heavy loadings of coal which in the week of November 13 broke all records for one week, and the continued heavy movement of merchandise and miscellaneous freight which includes manufactured products and therefore reflects the activity of industry.

Active spindles in the cotton industry on October 1, aggregating 98.9 per cent of capacity, showed a slight increase over those active September 1, and indicated the industry to be

operating at close to single shift capacity. The low price of cotton has been a great boon to the industry, and goods are now moving freely. Neither as regards raw cotton or finished goods, however, has there been a great deal of buying for future delivery, inasmuch as purchasers are convinced that they will have no difficulty in filling their requirements later at satisfactory prices. In the woolen industry, conditions have been the best in many months, and further improvement is expected to result from the settlement of the long strike in the ladies garment trade in New York City on a basis which will allow manufacturers a freer hand in reorganizing and increasing the efficiency of their shops. The silk trade, on the other hand, which a few months ago was booming while cottons and woollens were in the dumps, is now suffering from excessive competition. Rayon prices, which were cut 25 to 45 cents a pound last July, have again been marked down 5 to 25 cents a pound, bringing them down to the lowest ever quoted. These reductions were necessitated by the growing surplus of supplies and the need for meeting foreign competitors, who are said to be underselling the domestic market by 20 to 25 cents a pound.

## Steel Mills Active

The steel industry continues to make a remarkably good showing, considering its sustained activity through the summer. October production of steel ingots totaling 4,093,000 tons was the largest for any October on record, and while production is now dropping off gradually, consumption in most lines continues high, and no large decline is anticipated.

Whether or not the steel industry's hopes for sustained activity are to be realized depends in large measure upon the course of events in the construction industry. Building has been going ahead at a very rapid pace for a long time, and it would surprise no one if operations should slacken off a bit in 1927, but no very serious decline seems imminent. New contracting is still coming forward in large volume, and recent permit statistics have likewise made a good showing, the figures for October in leading cities showing an increase of 24 per cent over September and a drop of only 4 per cent from October last year. It is interesting to note that despite the growing conviction that residential requirements are becoming over-supplied in many cities recent surveys conducted in sections of New York City where this type of building has been particularly heavy are said to have revealed no more than a normal proportion of vacancies.

Ordinarily, building booms do not terminate while building costs are on a stable basis, and with any slump in residential construction other types of building are likely to take up the

slack. The requirements of the American people are always growing and its cities and industries are being constantly made over to suit them. There is always work to be done and the process of keeping our commercial and industrial plant and our cities in step with the times goes on so long as funds are available at reasonable rates and costs are not regarded as prohibitive.

#### Railway Buying a Possible Factor

Railway equipment interests are confident of larger business from the railroads during the coming year. For a number of years the railroads have bought sparingly of new equipment, their policy being to handle the growing traffic volume by means of a more intensive use of facilities already existing. With a continued increase, however, in the country's transportation requirements, the opinion prevails that the roads have about reached the limit of possible economies in this direction, and that substantial additions to equipment will soon be necessary to maintain present standards of operating efficiency. During the four weeks ended November 27 locomotive buying took quite a spurt, the new orders totaling 228, compared with 117 in the corresponding period of last year.

#### More Cheerful About Cotton

One month ago the low price of cotton was commonly named as the most depressing factor in the outlook for general business in the coming year. Reflection, however, has very much modified the first impression as to the net influence of the big crop. It is realized that a large offset to the unfavorable effect upon producers is to be found in cheaper cotton goods to consumers and more regular employment to the cotton goods industry than it has known for a number of years. Furthermore, as the South has taken stock of its possessions it has found that while cotton is still one of its great assets it is relatively much less important than formerly. The fruit and truck crops have been increasing rapidly in importance, and peanuts, pecans, poultry, pigs, tobacco and dairy products likewise. So much for agriculture, and the manufacturing industries have become a great factor in the financial independence of the States east of the Mississippi. In Georgia and North Carolina cotton has been relegated to a relatively small position in the annual budget, so great has been the development in other lines.

#### The Outlook in Texas

Texas absolutely refuses to be disconsolate about its crop of 5,800,000 bales or the low price.

The Drover's Telegram, of Kansas City, has published within a few days an interview with

a pioneer ranchman of northwest Texas, which corresponds so well with numerous reports which we have from that state that we reproduce it as giving a broad summary. He said:

The present year will go down in history as the most prosperous year in the history of Texas. Texas is a big state, as large as several ordinary states, and we are just as large in products, as we have varied soils, and varied climates, producing tropical products, as well as grain and other farm crops. It was good everywhere in this big state this year, and we are smiling. In spots where cattlemen have lost money during the past few years, can be found the largest oil field in the world today, scattering millions of dollars everywhere. In other parts the wheat crop in many cases paid for the land that raised it, and in the great sheep district in the southern part of the state, flockmasters have made money.

In the part of the state where I have been located so many years, we raised immense corn, wheat, oats and feed crops, such as we have not raised in years. On my ranch I raise barley for feed, and find it a fine crop for stock, besides raising Kafir corn and cane. The pecan crop raised this year in my section of the state yielded an immense amount of these nuts which are a staple product. With so much feed on hand we are prepared to carry through the winter more cattle than usual. Wheat fields are green, and the ground is in the best of condition to keep it coming.

This may be a little high colored for the sections devoted to cotton, but it shows another part of the picture. Confirming it we have a statement from Mr. Amon G. Carter, President of the Fort Worth Star-Telegram, dated November 22, in which he says:

Irrespective of the unusually low price of cotton, Texas will produce over one billion dollars in agricultural products this year, having a gain of one hundred and thirty-two million dollars on our grain crop alone. So, if anyone should mention the fact that business is dull in this part of the country, take the statement with a degree of allowance.

Mr. J. T. Scott, president of the First National Bank of Houston, after commenting upon various phases of the situation sums up by saying that in his opinion Texas as a whole is in much better condition than a year ago.

In 1925 Texas raised approximately 4,000,000 bales of cotton, which at \$100 per bale was worth about \$400,000,000. This year it has 5,800,000 bales, which if worth 10 cents per pound, or \$50 per bale, should give \$290,000,000. Apparently the gain in the grain crop will fully cover the shrinkage of cotton.

A considerable district in Texas raised almost no crop last year by reason of drought, while this year that section not only had a good cotton crop, but good crops of other products.

#### Higher Prices for Sugar

The market for raw and refined sugars has been active and advancing in the past month, as the result of a reduction in production estimates, partly from natural causes and partly from governmental action in Cuba. The world's sugar crop of 1925-26 was the largest ever produced, aggregating 24,360,150 tons, against 23,622,530 in 1924-25, 20,109,308 in 1923-24, 18,153,256 in 1922-23 and 18,208,221 in 1912-13. Beet sugar production was curtailed in Europe



during the war, but cane and beet production outside of Europe was stimulated by the high prices, with the result that in 1926, with beet production in Europe restored to practically the pre-war-volume, the world has had more sugar than it has known what to do with.

Last May the Congress of Cuba passed a law authorizing the President to restrict the grinding of cane on the island, which he did, with the result that the Cuban crop for 1925-26 reached only 4,884,658 tons, against 5,125,970 tons in the preceding year. He also shortened the grinding season on the new crop by proclaiming that the season should not open until January 1, 1927. These two moves have had the effect of eliminating any carry-over of sugar in Cuba from the old crop.

The President has it in his power to further limit the Cuban production, but even without further official action the Cuban crop, estimated at 5,000,000 tons, taken in conjunction with a diminished outturn from the beet crop of Europe by reason of bad weather, will effect a total reduction of the world's crop to approximately 23,863,000 tons, according to Willet & Gray, or by approximately 500,000 tons.

The consumption of sugar has increased largely in the last two years, presumably as the result of lower prices, and at the recent rate of increase it now appears probable that the present surplus will be eliminated this year, if rising prices do not stimulate increased production. The price of Cuban raws is now approximately 1 cent per pound above that prevailing one year ago, which if sustained means a gain to producers of more than \$100,000,000 on the forthcoming Cuban crop. The last crop realized a loss to most of the companies operating in Cuba and poor returns to the colonos and laborers who shared in the making. Nobody will grudge them the better prices now indicated, if realized.

Cuba produced last year approximately 20 per cent of the world's crop of sugar. The other 80 per cent came from many countries, and there remains the possibility that they may increase their production to such an extent as to offset in some degree if not fully the effect of Cuba's action. This is a risk in which every attempt at the regulation of a crop of world-wide production is more or less involved. None of the other producing countries are co-operating with Cuba in restriction.

Whatever is helpful to the prosperity of Cuba reacts in like manner in the United States, as Cuba's purchases abroad are chiefly made in this country. It is particularly desirable in view of the poor returns from sugar last year, and the losses recently inflicted by the hurricane, that good returns shall be realized from this year's crop.

American tourists who contemplate visiting Cuba this winter will be interested to know

that Havana has completely recovered from the storm, and that all the entertainments and attractions usually interesting to visitors will be found as enjoyable as heretofore.

### **The Boom in Coal Mining**

The bituminous coal industry has been booming in recent months due to heavy foreign demand caused by the British strike, replenishment of low stocks in this country, heavy domestic consumption, and possibly some unusual accumulation by consumers of coal in apprehension of a strike next spring when the Jacksonville wage agreement expires. During the week of November 20 the output of 14,253,000 tons of bituminous set a new high mark in the history of the industry.

Prices have been soaring, the Coal Age index of spot prices at the mines rising over 100 points between October 4 and November 8 to 299 per cent of the 1914 average. This is the highest level touched since the 1922 coal strike and compares with an average around 160 during the summer when prices stood at the lowest levels since before the war. Lately, however, as prospects for the settlement of the British strike have brightened, coal prices here have weakened somewhat and on November 29 the index showed a loss of 60 points to 239.

### **Increasing Coal Exports**

Reflecting the influence of the British strike, American exports of coal and coke during October totaled 4,731,958 tons, valued at \$26,438,647, compared with 1,359,978 tons valued at \$6,228,801 in October, 1925, while the cumulative figures for the ten months ended October 31 revealed a total of 26,321,924 tons valued at \$145,197,233 as against 16,152,657 tons valued at \$92,218,541 in the corresponding period of last year. So heavy has been this movement that it has diverted a substantial amount of ship tonnage from the grain and cotton carrying trade, thus creating considerable congestion in the outward movement of those commodities and causing the sharpest advances in ocean freight rates since the war.

### **Domestic Coal Buying Heavy**

Important as has been the influence of foreign buying in the coal market, it would be a mistake to attribute the present boom solely to that source. Even at the high rate of export maintained in October the month's shipments of 4,188,365 tons of bituminous amounted to considerably less than half the output of the mines for one week at the current rate of production. With domestic industry running full tilt, the home consumption of coal has been heavy, in addition to which consumers apparently have been building up stocks. According to a report of the Geological Survey issued November 8, stocks of bituminous coal

on hand with commercial consumers and retail dealers October 1 amounted to 44,000,000 tons, or an increase of about 5,000,000 tons compared with stocks July 1. While comparison with stocks in previous years does not indicate that these figures are abnormally large (the stocks on September 1, 1925, being 43,000,000 tons and those on September 1, 1924, 47,000,000 tons), developments since then indicate that further substantial additions have been made to stocks notwithstanding the high prices prevailing.

#### **The Wage Situation**

One factor already referred to as possibly influencing buyers at the present time is the expiration of the Jacksonville agreement on March 31, next, and apprehension of a strike over the terms of the new agreement. The Jacksonville agreement, it will be recalled, was concluded between the operators and miners in the unionized fields in the Spring of 1924, and provided for the maintenance of wages above the war-time peak. As a result, the unionized companies, unable to compete with non-union companies paying a lower scale, suffered heavy losses, many were forced to close down, and thousands of union miners were thrown out of work. After a period of protracted losses many of the companies reopened with non-union labor on the basis of the 1917 scale, which was about 33½ per cent below the scale of the Jacksonville agreement.

With the recent boom in the industry and the opening up of many high cost mines heretofore idle, demand for labor has again overtaken supply, and some of the leading operators have voluntarily gone back to approximately the levels of the Jacksonville scale. These wage advances have been seized upon by union officials as a vindication of the Jacksonville agreement. Commenting on the advances, John L. Lewis, President of the United Mine Workers, is quoted as follows:

The fact that these operators have returned to the scale proves that they can make money under the Jacksonville terms, which they avowed when they broke their contract would precipitate bankruptcy. . . . That they are producing now under the Jacksonville scale proves our contention that there was no good reason in the first place for any reduction.

Obviously, however, the ability to pay these wages depends upon the maintenance of coal prices at the present abnormal levels, to which they have been brought by a combination of circumstances, which is not likely to last very long. The industry has been suffering from over-expansion and a wasteful degree of unemployment, and it is very much to be desired that a settlement will be reached next Spring which, while making better earnings possible for the men, will also give cheaper coal to the industries.

#### **Money and Banking**

Outstanding features of the banking situation during the month were a further decline in loans secured by stocks and bonds to levels for the first time below those of 1925, an increase in other loans, including commercial and unsecured loans of every kind, to the highest level in five years, and the continued tendency for the total of bank loans and investments to show a larger spread over last year than deposits.

On November 24 the total of loans secured by stocks and bonds of the principal banks in leading cities that report weekly to the Federal Reserve Board stood at \$5,366,000,000, a decrease of \$235,000,000 from the year's peak reached at the end of September and of about \$52,000,000 from the total on the corresponding date of a year ago. On the same date the holdings by these banks of securities on their own account stood at \$5,524,000,000, a decrease of \$199,000,000 from the peak reached in June, but still some \$119,000,000 above the total on the corresponding date of 1925.

Contrasting with these reductions in member bank collateral loans and investment holdings, all other loans and discounts, classified somewhat loosely as commercial loans, continued to creep slowly upward, and on November 24 were the highest since 1921 and over \$418,000,000 above the total on the corresponding date of 1925.

The net result of all these changes was a decline during the month in total loans and investments to \$19,849,000,000, a total \$485,000,000 above a year ago, compared with a spread of nearly a billion dollars during the earlier months of the year. Coincident with the decline in total loans and investments, deposits also declined, and on November 24 were about \$300,000,000 above a year ago, compared with a spread of around \$600,000,000 during previous months.

#### **Federal Reserve Credit**

At the Federal reserve banks, the volume of member bank rediscounting has followed a normal course for the season on a level averaging only slightly above that of a year ago. Bills bought in the open market, though expanding with the seasonal movement of commodities, are running slightly below those of a year ago, while holdings of United States securities are also somewhat under 1925 levels. Despite the high level of trade and industry, the banks continue to find it possible to finance all requirements largely from their own resources, and the volume of Federal reserve credit outstanding remains moderate.

### Gold Movements

Gold movements during the month included the shipment of \$6,000,000 to Canada, accompanying heavy seasonal exports of grain from Canada and a rise in Canadian exchange to premiums ranging as high as 3/16 of one per cent. Further gold shipments, however, are not expected, so that the movement apparently will fall considerably short of last season's total of approximately \$42,000,000. Following the closing of lake navigation, the exchange rate frequently becomes less favorable to Canada and a return flow of gold to this country often occurs.

Considerable attention was also attracted by the report of a small amount of gold engaged in London for shipment to this country, but the purchase constituted something in the nature of a special transaction and is not expected to be repeated. Despite the adverse effect of the coal strike, sterling has held up impressively during the greater part of the autumn. With the bulk of the seasonal pressure on sterling probably passed, the coal situation gradually clearing up, and money rates in London ruling above those in New York, any substantial movement of gold from London to New York this season is now regarded as unlikely.

### Money Rates

Money rates in New York displayed the usual slightly easier trend in November, the steady demand for commercial accommodation being offset by the reduction in the volume of funds employed in the security markets. Call money rates held around 4¼ to 4½ per cent most of the time, while time money rates eased slightly and were quoted at the close of the month at 4½ per cent for 60-90 day loans and 4½ to 4¾ per cent on 4 to 6 months money. In the open market for commercial paper, prime names offered chiefly at 4½ per cent were a shade lower than a month previous, while 90-day bankers bills were quoted at 3¾ per cent against 3¾ at the close of October.

With bank loans, however, showing larger increases over last year than deposits, and with member bank rediscounting at Reserve banks equalling last year's levels, basic money conditions continue opposed to any permanent lowering of money rates. Preparations for the usual December 1 settlements, gradual increasing currency demands for the holiday trade, and the export of gold to Canada brought about a firmer tone towards the close of the month and call rates rose to 5 and 5½ per cent. Barring the possibility of a temporary decline at the December 15 quarterly tax day, money rates should rule on a somewhat higher level from now on until after the close of the year, when the usual temporary January easing would be in order.

### The Bond Market

Under the stimulus of easy money rates, continuance of business at prosperous levels and firm commodity prices, the bond market during November pursued a steadily upward course. Any complaint of "poor business" among dealers comes from inability to get good bonds to sell rather than from any lack of demand. The volume of new issues was maintained at a relatively high level but the requirements of investors were so much greater as to give the appearance of an actual shortage. Until there is some change in the fundamental situation, such as substantial hardening of money rates, cessation of profitable corporate activity or reduction in employment, none of which as yet appear upon the horizon, there is little reason to expect any change in the bond market trend. The upward spurt in prices during the month seems rather to be a belated readjustment of bond prices to what now appears as a fairly permanent higher level.

The one thing which above all others has enabled this country to absorb a gradually increasing volume of new securities each year is the widening character of the investment market. During the past several years, in fact since 1917, the number of new bond buyers has increased tremendously. Men and women in all walks of life, many of whom formerly had looked upon bonds as only for the rich, are now themselves consistent investors. Several million persons in the United States today belong to the so-called investor class, as compared with less than 500,000 during pre-war days. In the last analysis of course these persons are able to invest because the new wealth resulting from general prosperity is being distributed more widely among our population than ever before.

During the month numerous individual issues made new high records for the year. The Dow Jones average for 40 listed Domestic corporate issues (10 high grade rails, 10 second grade rails, 10 industrials and 10 public utilities) on November 24th was 95.85 as compared with 95.08 on October 25th and 92.42 on November 24th a year ago. The present average, representing a new high for the year, is only .41 less than the post-war high reached in 1917. There is a striking uniformity in the advance within the individual groups, each of which is now at or hovering near its high.

	Nov. 24, 1926	Nov. 24, 1925
High Grade Rails .....	92.75	89.11
Second Grade Rails .....	95.04	91.16
Public Utilities .....	95.39	91.87
Industrials .....	100.22	97.55

With foreign bonds increasingly active at steadily rising prices and United States Treasury obligations enjoying a spirited advance, it



seems probable that the general level of prices for all types of bonds is not only well above any previous high for the year but actually above 1917 levels. When contrasted with bond prices during recent years, the present bond market seems high, but when measured by pre-war standards and by the average levels for long periods of time, present prices are still substantially below former records.

#### United States Securities

Trading in United States Government obligations during the month was fairly sensational and several issues reached the highest levels of all time. The President's proposal for a substantial rebate on income taxes of individuals and corporations on 1926 payments not only indicates a splendid condition of the United States Treasury but also foreshadows an unexpectedly large volume of funds available for investment in securities. It is not surprising, therefore, that many Government obligations should sell at record levels. On November 24th Treasury 4½s sold at 109-22/32 while the Treasury 4s sold at 105-18/32, both figures representing the highest prices for all time.

#### Municipals

Although activity in the Municipal list lagged behind that of the other groups, a fair renewal of investment buying caused a movement toward the slightly higher price levels of earlier autumn. The strength in the general bond market, the reduced volume of new Municipal offerings, and the proximity of the usual year end reinvestment activity, are all strong supporting influences. The sporadic character of retail distribution, however, gives rise to the possibility that the recent firmer undertone may be due quite as much to inter-dealer bidding in anticipation of stronger year end demand as to the actual buying activity of investors.

The clearing up of the Texas road bond situation through the passage of a validating act by the State legislature has caused a resumption of activity in Texas issues generally. Considerable Municipal financing which has been held in abeyance pending the outcome of the road district controversy has now been completed and more is contemplated, reflecting a more favorable attitude among bankers and investors. While the prices of strictly road district bonds are still below their levels of a year ago, and the volume is still restricted, there has been renewed activity recently at improving prices.

#### Rails

The succession of million car weeks since early summer, coupled with the favorable earnings records, have given railway bonds a decided impetus. The ton mile figures, now available for the first eight months of this

year, exceed by 2.7 per cent the best previous record for a like period. Compared with the record for last year the increase is over 7 per cent. Although activity in the low grade issues is well sustained, there is a renewal of interest in higher grade underlying securities, particularly those legal for savings bank and trust fund investments. The Atchison Topeka and Santa Fe General 4s of 1995, the premier railway investment, are around 92¾ as compared with a high for the year of 93¾ and a low of 89½. Pennsylvania Railway 3½s of 1941, while not traded in extensively, moved upward several points and are quoted at around 87, the high for the year. Chicago, Burlington and Quincy Refunding 5s of 1971 traded up to 107½, a new high for the year. There was pronounced accumulation in bonds of the Chicago Milwaukee and St. Paul because of the prospect that the road will shortly be lifted from receivership. The awarding of the property at auction to the Kuhn Loeb-National City syndicate is an important step to complete reorganization. Erie Railroad junior issues were moderately active and a shade higher. New York, New Haven and Hartford 4s of 1955 and 1956 each also recorded substantial gains.

#### Industrials

The continuing high level of industrial earnings which has meant the steady piling up of equities back of industrial bonds, was reflected in greater strength in industrial securities. The strong treasury position of American corporations as a class is attested by the pre-payment during the month in advance of maturity nearly \$80,000,000 of corporate issues. Many of these are of course high rate issues which call for heavy prepayment premiums, in some cases running as high as twenty points. In some instances these called bonds are being paid out of corporate treasuries and in others are being replaced by new securities bearing lower interest rates.

Sound industrial bonds of all types were in good demand. Sugar company issues moved into higher territory in response to higher raw sugar prices. Cuba Cane Sugar 7s and 8s registered good gains as did also Manati 7½s and South Porto Rico 7s, the latter at 109¾ reaching the year's high. The improved outlook for the industry seems to justify these improved levels. Fertilizer company issues, which have recently been under pressure because of the unfavorable market situation in cotton, are again strong, Virginia-Carolina 7s for instance, advancing over two points to 108 and American Agricultural Chemicals 7½s to 104. Numerous convertible issues reached high levels, notably American Ice Convertible 7s of 1939 at 130 and Granby Copper Convertible 7s of 1930 at 142.

### Foreign Bonds

In response to improving conditions in the foreign field and to constantly widening participation by American investors in foreign financing, foreign bonds during the month advanced under unusually active trading.

### The Agricultural Situation

The crops now are practically accounted for, and in volume leave little to be desired. The total acreage in cultivation was about two per cent larger than that harvested in 1925, and the combined yield, as calculated by the Department of Agriculture, is 3.4 above that of last year and 3 per cent above the average of the last ten years. It appears, therefore, that the low prices which have been prevailing for farm products, and the reported trend of population from the farms to the cities, have not as yet had the effect of reducing production in the aggregate. It is especially noteworthy in view of the somewhat sensational reports which were in circulation a few years ago about the migration of negroes from the rural districts of the South, that that section should now produce a cotton crop more than 2,000,000 bales larger than it ever produced before.

The Department's final figures for either yields or values are not yet available, but its estimate of aggregate value for all but the cotton crop, as of November 1, based upon market value per pound, places the total farm production of 1926, with the exception named, 2.9 per cent above that of 1925 and 7.3 per cent above the average of the last five years. Although, as in many other years, results are more or less uneven over the country, the trend is in the way of improvement, and on the whole the outcome must be considered good. Since the increase of population in this country is at the rate of less than 1.5 per cent per year, it is not inexplicable that the rise in prices of farm products has not been more pronounced, in view of the fact that production has been increasing. It is well known that the war gave a great stimulus to agricultural production in all countries outside of Europe, and neither in the competing countries nor in the United States has any considerable curtailment of production taken place since the war. If it be true that the farms have been losing population, it must be that the remaining farm population is gaining in productive efficiency, or that the weather conditions have been more favorable. Either explanation would imply lower costs of production, while values on the whole are rising.

While the trend of aggregate value is not far from what might be expected in view of the relation of production to population, the prices of individual products have fluctuated continually in close response to the relations

between supply and demand. Wheat, corn, oats, cotton, sugar, potatoes, wool, live stock and dairy products have moved separately and independently, apparently governed in each case by the master influence. If on the whole production is so large as to make prices unduly low, the necessary conclusion would seem to be that there still are more people on the farms than are needed to maintain the desired price situation.

### Corn and Live Stock

A short crop of corn in 1924 caused a sharp rise in the price of that grain and the average crop of 1924 caused a decline. Unfortunately the influence of the short crop has deranged the value relations between corn and live stock ever since. In the years 1923 and 1924 the receipts of hogs at all public stock yards, as reported by the Department of Agriculture, aggregated 55,330,000 and 55,414,000, respectively. In 1925 they fell to 43,920,000, and in the twelve months from November 1, 1925, to October 31, 1926, they totalled only 40,713,000. This decline in a year's receipts from 55,000,000 to 40,000,000, or 27 per cent, is chargeable to the short corn crop of 1924, and this falling off in hog production has been responsible for the unsatisfactory prices of corn during the past year.

Furthermore, the low consumption of corn in the past year has been responsible for a carry-over from the 1925 crop, which on November 1, 1926, aggregated over 200,000,000 bushels. The Department of Agriculture estimates the stock of old corn on farms November 1 at 181,000,000 bushels, in addition to which there were over 25,000,000 in the visible supply. The large receipts of old corn from the country in the past two months have depressed the corn market, prices on the December delivery, Chicago, having gone off about 10 cents per bushel since October 1st. The decline on the May delivery has been about 7 cents, to approximately 80 cents, Chicago.

Oats have suffered in sympathy with corn, but not so much, the decline in the last two months being from 44 to 41 cents. Oats are above last year's price, but corn about 5 cents below. Both are feed grains, raw materials for the production of meat and animal products, and their prices quickly reflect any disturbance of the normal demand for such purposes. As hog production increases, corn prices will rise, unless the production of corn is correspondingly increased. It is a reasonable prediction that corn prices will improve in the coming year.

Cattle and sheep have shown no significant price-trend in the past month. It is probable that beef consumption in this country has been greater in 1926 than in any previous year. There has been little exportation, and slaughtering under government inspection are mak-



ing a new record, excepting possibly 1918 and 1919, when exports were important. For the 10 months ending with November, the total receipts of cattle at ten leading markets were 10,173,693 head, against 10,007,617 head in the corresponding period of 1925. Sheep receipts for the same time have been 12,828,565 head, against 11,817,939 last year. The feeder cattle movement in the same time has been 2,242,448 head, against 2,233,353 last year. "Feeders" are unfinished cattle sold in the central markets to go into feed lots in the corn belt, destined to come back later for slaughter.

The losses in heavy beef cattle in the past season, in contrast with good profits in the preceding year, have been due to much larger supplies of this class of cattle, and to an increasing preference on the part of consumers for beef from younger cattle. While the heavy cattle are a drag on the market the demand for "baby beef" exceeds the supply.

The feeling in the cattle industry is better than several months ago. Pasturage is fine in the Southwest and the demand for young cattle is strong. Range conditions are not so good in Wyoming and Montana.

#### The Wheat Market

The wheat situation has changed against holders, in the past month, the large Canadian crop having become a certainty and large yields having become probable in Australia and Argentina. The official estimate for Canada is 406,000,000 bushels.

The Canadian prospect was obscured for a time by very bad harvesting conditions, but these have cleared up so far at least that harvest has been completed, although much of the crop has been lowered in grade. Australia and Argentina seem likely to have approximately 250,000,000 bushels for export.

The needs of the importing countries have been estimated at 700,000,000 to 750,000,000 bushels. The United States and Canada are estimated to have 500,000,000 to spare, but there is considerable low grade wheat in the Canadian supply. With 250,000,000 bushels available for export in the Southern hemisphere there would seem to be enough for the requirements, but the question of quality is a factor. The United States has exported about 125,000,000 bushels net on this crop. Up to November 1 the Russian Government had collected 87,300,000 bushels of wheat of this year's crop, against 51,700,000 to that date last year. Exports from Russian and Black Sea ports to November 13 amount to 17,380,000 bushels, against 12,784,000 in the same period last year.

#### Dairy Products

The price of the highest grade of butter is now higher on the New York market than at this time last year, by one to two cents per

pound, and higher than in any other important market in the world. The medium to good grades are a few cents lower than at this time last year, but much above prices in other markets. The main supply of good butter for this market comes from northwest of Chicago, and production in that region has been falling a little below last year's output, on account of weather conditions. This is making an opening for foreign butter, which is coming in freely of late, paying the customs duty of 12 cents per pound. The best butter, 92 score, is selling at about 52 cents or better, and Danish butter, which is the only foreign butter bringing the top price in this market, is delivered here at 37 c. i. f. (cost, insurance and freight paid), subject to the duty. Several lots of Siberian butter have arrived from London, and have sold at 42½ to 43½ cents, duty paid. About 6,500 casks of New Zealand make are on the way from London, priced at 33½ to 34½ c. i. f. The Dalgety Company, a large British corporation, dealing in farm products and operating in Australia and New Zealand, in its annual report rendered to stockholders in London in the past month discussed the butter situation as follows:

The course of the market for New Zealand and Australian butter this year has been very different from that of the preceding two years, when values rose during the late summer and autumn months, and an exceedingly high price was reached in the month of October. In 1923 198s. (shillings per cwt.), in 1924 228s., and in 1925 234s. was obtained for finest New Zealand, with Australian only relatively a little less. In October of this year the price was 136s., and today finest New Zealand is quoted at 146s. to 148s. The chief causes of this reversal of conditions were (1) the lamentable strike in the coal industry, which seriously curtailed the spending power of the masses; (2) the prolific make and importation of butter from European countries; and (3) the fact that stocks were steadily increasing, which was common knowledge and relieved buyers of the necessity of purchasing large quantities to cover any possible shortage.

In the United States, the supply of butter in storage has been above that of last year, but diminishing of late, and the statement for December 1st is expected to show stocks under those of one year ago.

#### Tobacco

The tobacco crop was somewhat smaller than last year, the government estimate indicating a yield of 1,304,000,000 lbs., compared with 1,365,000,000 in 1925, but both crops were well above the average over a period of years. Last spring the cold, wet weather delayed the transplanting of the plants, and the drought which followed for several weeks retarded growth. With some of the old 1923 and 1924 leaf still on hand, stocks seem to be ample and prices generally have shown a declining tendency for several months.

An exception is found in the bright flue-cured tobaccos of the Carolinas and Virginia which are in great demand for cigarettes. The

crop this year was of particularly fine quality and brought top prices at the auction sales which are now drawing to a close, so that the return to the tobacco growers in these three states will be several million dollars more than last year.

#### **The Cotton Crop**

We gave considerable space last month to a discussion of the cotton situation, on the strength of the Government report as of October 20 estimating the crop at 17,454,000 bales. These figures looked large in comparison with the estimate one month earlier of 15,810,000 bales and the final ginnings figures of 16,104,000 for the 1925 crop, but the Government report dated November 22, based on conditions on November 14, indicates a crop of 18,344,000 bales. This estimate is greater by approximately 2,000,000 bales than the largest yield heretofore made. Based upon the estimate of 47,207,000 acres to be harvested the yield per acre is 186.3 lbs., which compares with 167.2 lbs. last year, and 209 in 1914, when the crop ranking next in size to the present one was grown.

If a crop of 17,454,000 bales presented a problem, one nearly a million bales larger might be expected to present a larger one, but the market has taken the increase with but slight disturbance. The selling pressure has been light for the size of the crop, indicating that holders are impressed by the interest manifested at Washington and the activities in behalf of support for the holding movement. Although there is general acquiescence in the Government's estimate of the size of the crop grown, an opinion prevails to some extent that much of the crop is of low grade and will not be worth picking at the low value for that quality.

#### **Uncertainties of the Market**

There is general agreement that current prices are below the cost at which the great bulk of the cotton crop is produced, and that the acreage will be largely curtailed, with or without an agreement, unless the price rises before planting time. This is the consideration inducing purchases of cotton against the future demand. The buyer's problem is to determine to his satisfaction how long he may have to wait until crop curtailment or increased consumption will raise the price to a point that will enable him to recover his original investment, plus interest carrying charges and a profit. Cotton contracts on the New York Cotton Exchange now represent a price for the October, 1927, delivery only about .6 of one cent per pound over the December, 1926, delivery. The carry-over of American cotton at the end of the present crop year probably will be 8,000,000 to 9,000,000

bales, an amount equal to more than one-half an average crop. Somebody must carry cotton until the surplus is down to normal proportions, and whether this is done by the farmers or persons who buy of the farmers the outcome is more or less speculative. Although speculators never have a good name with producers, it is obvious that such speculation is legitimate business and very much needed at the present time. Moreover, the cotton exchanges are an effective agency for the purpose.

#### **Ample Credit Facilities**

Not as much is being said now as a month ago about extraordinary means for carrying the cotton surplus. Numerous financial organizations have been formed to lend on cotton in warehouses, the paper to be passed up to the intermediate banks which function in connection with the land banks. These organizations have served a good purpose in restoring confidence, but it is probable that in most of the States the regular banking facilities will be sufficient to meet all needs.

This was brought out very clearly at a meeting held at Atlanta by Mr. Eugene Meyer, representing the Committee appointed by President Coolidge to consider the cotton situation. Mr. Mills B. Lane, president of the Citizens and Southern Bank of Georgia, made the statement that the banks of Georgia are amply able to finance Georgia's proportion of the 4,000,000 bales which it is proposed to hold off the market, and much more, without asking any assistance from Washington or elsewhere, that ample warehouse capacity is available, and that the Georgia Cotton Growers Association is already organized and prepared to handle all the cotton it can get. Moreover, touching cotton-growing policy in the future, Mr. Lane said that Georgia already had diversified and is diversifying all that was necessary for one of the cotton-producing states to diversify, producing this year less than 1,500,000 bales of cotton against 2,800,000 bales prior to 1915. He expressed the opinion that all of the large banks in the State would be very glad to assist in financing the 300,000 bales of cotton, even though the cotton was to be carried for twenty-four months, provided it was properly warehoused, insured and the margin always kept within 20 per cent of the value of the cotton.

In Texas arrangements have been made for supplying all the credit that may be needed to handle the great crop of that State, and it is understood that there will be no difficulty on that score in any of the producing States. Furthermore, any amount of credit can be had outside. It goes without saying, however, that bankers have no intention buying cotton or assuming the risks of the market. They could

not do this without violating the banking laws, state and national. Bankers will supply credit upon very reasonable terms, but if the price is to be maintained, producers, spinners and dealers must do it, with such help as they can get from outsiders who may be classed as investors or speculators, as best suits the degree of respect which it is desired to accord them.

### Bank Failures in the West

Another outbreak of bank failures has occurred in the Middle West in the past month, for the most part in Iowa, where nineteen banks closed in one day, following an agreed policy. All of this group were located in two adjoining counties, and in a part of the State where failures have been numerous in the past year. The action was agreed upon for the purpose of obtaining time-waivers upon deposit withdrawals and of reorganizing, in some instances with new capital, thereby continuing banking service in the communities, conserving assets and saving the good will value of the institutions as going concerns. The situation is somewhat like that which existed in 1907, when suspension of cash payments was so general over the country that it did not injure a bank's reputation to follow suit.

These failures cannot be said to be due to present conditions in Iowa in any other sense than that farm income has not improved sufficiently to make good a lot of paper which the banks acquired in the post-war boom period. The people of Iowa were able to go through the war and buy their full quota of Liberty bonds without greatly increasing their indebtedness, but in the two years from the date of the armistice to the end of 1920 they went into debt heavily, and the decline of prices has made this indebtedness very hard to pay.

### An Analysis of Inflation

Anyone wishing to have a comprehensive and unprejudiced account of inflation and deflation in Iowa and the results to Iowa banks will do well to read an article by F. L. Garlock, entitled "Bank Failures in Iowa," which appeared in the January, 1926, number of "The Journal of Land and Public Utility Economics," a publication edited by Dr. Richard T. Ely, the eminent economist, long head of the Department of Economics of the University of Wisconsin, and founder of the Institute for Research in Land Economics and Public Utilities, connected with Northwestern University.

We have room only for the following extract:

Rising prices affected both banks and their customers with an optimism which swept aside the conservative standards of experience and promoted extravagance and speculation. Whatever the customers purchased, whether merchandise or land, they were able to sell at an extraordinary profit; whatever was produced on their farms brought unusual returns.

Some few persons, uncertain of what disposition should be made of the unexpected harvest, began reducing their fixed indebtedness. It was not long, however, until the continuously rising prices, the encouragement of the bankers, and the methods used by the government in selling war securities, had convinced the majority that debt was a blessing in disguise, as it became progressively easier to liquidate and offered a means of extending profit-making activities. Under the urge of these influences, industry expanded and thrived, promoters of all types came into their own, and thrift gave way to extravagance. Bankers found their accustomed standard of credit analysis growing obsolete, for values increased automatically with the passing of time. Hence it was that, as the speculative fever gained a foothold and grew and the demands for bank funds enlarged, credit was extended to all manner of persons on—or without—all kinds of security, excess lines became commonplace, customers' notes given to promoters of questionable and fraudulent enterprises were discounted for rich rewards, and large sums were advanced to land speculators. Borrowing for the purpose of re-lending became an established practice. Time and time again the banks were saved from the effects of their ill-advised acts by the continuous growth of deposits. As the period drew to an end, during late 1919 and early 1920, caution was thrown to the wind by both bankers and their customers, speculation became rife, an enormous burden of debt was contracted, and economy was lost in a swirl of extravagance.

An investigation by the United States Department of Agriculture shows the following numbers of sales of improved land in sixty Iowa counties in 1919: January to March, inclusive, 127; April, 120; May, 244; June, 382; July, 367; August, 158; September, 16. Average prices per acre during these corresponding months were reported as follows: \$237, \$240, \$238, \$247, \$255, \$259, and \$276. Furthermore, of 1,024 farms reported sold between January 1, 1919, and August, 1919, more than thirty per cent were resold one or more times.

In general terms this analysis of inflation would apply to conditions in all parts of the country, and in Japan, Argentine, Germany and most other countries as well. In Iowa the impulse to use credit found expression in land-buying, the purchase of new packing company stocks, etc., but in other localities it resorted to means of speculation particularly suited to conditions. The results to the speculators were about the same everywhere.

### The Inflation of Land Values

The bank failures still occurring in the Middle West are the aftermath of that period of inflation. Much of the paper taken by the banks at that time has not been paid, and probably much of what remains unpaid now never will be paid. In many instances the outcome depends upon a recovery of land values, and so much land is in default upon obligations created during the boom that land prices at present are unduly depressed. When these farms get into the hands of permanent owners values will improve and everybody in the State will feel better.

It should be understood in reading about agricultural and banking conditions in Iowa that the average value of all the farming lands in the State doubled from 1900 to 1910 and then doubled again from 1910 to 1920, after which it suffered a sharp decline. To be exact, the average census value of all farming lands



in Iowa in 1900 was \$36.35 per acre, in 1910 \$82.58 per acre, in 1920 \$199.28 per acre, and in 1925 \$119.28 per acre. These figures are for land alone, buildings not included. A gradual advance from \$36.35 in 1900 to \$119.28 in 1925 would have been a handsome addition to the annual earnings of a farm owner, but the rise to nearly \$200 and subsequent drop of \$80 per acre played mischief, as such fluctuations always do, in any kind of property. No such rise as that which occurred in Iowa lands during the boom period ever has occurred in any kind of property without subsequent disaster.

All authoritative information is to the effect that the banking situation in Iowa has vastly improved in recent years. Borrowings of Iowa banks outside the State have been largely paid off and the percentage of slow assets has been steadily diminishing. The State has passed through a severe experience, and a good many individuals have been hurt beyond recovery, but the actual value of the farms is as great, and the future of the State as well assured, as ever.

#### **Economic Conditions in Japan**

The Japanese yen is practically back at the old par with gold. There are some reasons for thinking that this has come about rather earlier than planned or perhaps desired by the Japanese financial authorities, inasmuch as they have consistently stated from time to time that they did not desire to accelerate the appreciation of the currency, but preferred that the recovery should be accomplished gradually and with a minimum disturbance of trade. Japan, like Denmark and Norway, has been to some extent embarrassed in its financial policies by a high reputation for financial stability. The exchange traders of the world have persistently believed that all of these countries would restore their currencies to former relations with gold, and have bought Japanese, Danish and Norwegian exchange on that theory, with the result that these currencies have appreciated largely through the persistent pressure of influences outside of their own governmental policies. That is to say, while all these governments have fully intended to eventually restore their currencies to par there is reason to think that they all contemplated a more gradual movement.

The depreciation of the Japanese currency was not a result of the war, but of the great earthquake and fire in 1923. Japan had a favorable trade balance throughout the war period, and accumulated large reserves of gold and foreign credits, but in common with practically all countries, maintained an embargo upon exports of gold, on account of the

chaos which existed in the international exchanges. After the war the first sharp break in prices following the world-wide post-war inflation occurred in Japan in the early part of 1920, spreading from there around the world. Japanese exchanges fluctuated only moderately during the years down to 1923, although the adverse trade balances were large and the embargo on gold exports had not been lifted. The par of exchange with the United States is 49.84 cents; and in the Summer of 1923, just before the earthquake, it was above 49 cents; and but for that calamity the embargo upon gold probably would have been soon removed. The disaster made necessary heavy importations of various materials and supplies, and the authorities considered it impracticable to attempt to support the exchange. Indeed, it probably was good policy under the circumstances to permit the depreciation, as it increased the cost of imports, and was thus in harmony with the increase of import duties put into effect at that time. The lowest point touched by the yen in this depreciation was about 38 cents, and the average rate for January, 1925, was 38.50. A vast improvement in the foreign trade position of the country took place in 1925. In 1923 the adverse trade balance was 534,480,000 yen, in 1924 it was 646,157,000 yen, and in 1925 it fell to 267,066,000 yen. The last sum is believed to be well within the country's favorable balance on the invisible foreign account.

#### **Statement by the Government**

As a result of the gain in the country's foreign trade position, the yen advanced to 40.51 cents in September, 1925, 42.97 in December, 44.25 in January, 1926, and 45 in February. A movement like this is bound to attract attention and there was reason to believe that speculation had become a factor in it. On February 23, 1926, the Minister of Finance replying to a question in the House of Representatives as to whether the government had any intention of lifting, in the near future, the embargo on gold, replied as follows:

As has been repeatedly declared, the Government have no such intention until they are firmly convinced that, by the natural and substantial improvement in the trade balance and foreign payments bringing the exchange rate within the vicinity of parity, there is no fear of the economic circles being subjected to considerable disturbance. There is no intention of lifting the embargo merely because of an exchange rate recovery caused temporarily by speculation. The Government sincerely hope that the market will shortly be relieved of the disturbing factor which has been brought about by the present unnatural appreciation of the exchange rate and which may produce undesirable effects not only on the foreign trade but on the general financial conditions of the country. As the present instability of exchange is largely due to a misconstrued idea of the intention of the authorities, it is confidently expected that the stability will be naturally restored if the public will fully understand the above-mentioned

policy of the Government and take the prudent course in directing their businesses.

While the desire of the Japanese Government to avoid a rapid fall of prices has not been doubted, the outside demand for yen exchange has continued strong, although the foreign trade situation have not been as favorable this year as last. The declining value of silver seems to have been a considerable factor in the demand for Japanese exchange, causing holders of silver in China and perhaps India to convert silver holdings into yen, which has proved to be an advantageous turn.

On the other hand, the higher valuation of the currency has meant lower prices for Japanese exports, and at the same time has tended to cheapen imports. Raw silk, the chief commodity in the exports, was quoted at 2,000 yen a bale in January last, and was down to 1,450 in April, but this fall was only in part due to the rise of exchange.

#### **This Year's Trade Conditions**

The latest trade returns for this year are to the end of October. In that month exports exceeded imports by nearly 50,000,000 yen, but for 10 months the excess of imports was approximately 348,900,000 yen. The last quarter of the year usually makes the best showing for exports and it now seems probable that the excess of imports for the year will not exceed 300,000,000 yen and perhaps be not much more than in 1925. In any case it is quite certain to be covered by the balance on the invisible account, which includes earnings of Japanese shipping and income from Japanese investments abroad.

It will be readily understood that a period of appreciating currency and falling prices is not one of marked prosperity. It is an up-hill pull to restore a depreciated currency, and a Government may well wish to accomplish it gradually. Now, however, that favorable conditions have aided the Japanese Government in securing the restoration of the yen to its normal gold relationship it is probable that official steps will be taken to maintain it in that position. Indeed, within the past week the Minister of Finance in a public address to a gathering of bankers at Osaka asked for national cooperation in the complete reestablishment of the gold standard. He is quoted as saying that the action was not being taken merely because the yen had advanced virtually to par, but that every financial and economic circumstance was being considered. The shipment of gold he declared to be one of the essentials, and he said that specie holdings abroad would be kept at adequate levels, even if it was necessary to use part of the specie owned by the Bank of Japan.

#### **Sound Economic Policies**

It deserves to be said that the Japanese have handled with great courage and ability the very difficult conditions arising from the earthquake disaster, which followed closely upon losses which Japan suffered in common with all countries from the post-war deflation. The Government has been rigidly economical and has required the people to adopt the same policy in their private affairs. The tariff was revised to discourage the importation of luxuries, foreign borrowing has been limited and the Government has abstained from borrowing in the home market. The national accounts for the fiscal year ended March 31, 1926, show a surplus of 546,383,000 yen, or over \$273,000,000. This it should be said was due in part to delay in carrying out reconstruction plans, but during all the trying period since the war the Government has not failed to close every fiscal year with a surplus.

The public policy throughout has been a resolute and consistent one, with the fixed purpose of eliminating unnecessary outlays and building up the resources of the country by a careful economy. The country has no dole system for the unemployed. The family life and customs are such that none is demanded. The family is a social unit. Each family expects to take care of any unfortunate or indigent members and does so.

The relations between Japan and the United States are of growing intimacy and importance. In 1925 the export of raw silk aggregated in value 35 per cent of Japan's exports, and of this 95 per cent was sent to the United States. Of the imports into Japan in 1925, approximately 25 per cent were from the United States, with India ranking next and no other country supplying more than one-third as much in value as the United States. This trade relationship is of great practical value to both countries and of itself should afford a complete guaranty of considerate and friendly policies on the part of each toward the other.

The financial position of Japan remains strong notwithstanding the heavy payments which the Government has been required to make abroad since 1923. These payments have been made largely from funds accumulated abroad during the war, and without encroaching upon the currency reserve in the Bank of Japan, which now equals 80 per cent of the outstanding circulation. Credit conditions have been gradually easing in the past year. The country has a great task yet before it to complete the reconstruction work in Yokohama and Tokio, but it is safe to say that the greatest strain has been passed, and that the policies to which the Government has thus far adhered will be carried through to complete achievement of the ends in view.

## The Future Supply of Food

Notwithstanding that the producers of the chief staples of agriculture are complaining of inadequate prices for their products, voices of authority continue to sound a warning that scarcity of foodstuffs is not far distant, unless scientific research shows the way to an intensification of production.

The British Association, the parent organization in Great Britain of our American Association for the Advancement of Science, recently has held its annual meeting for 1926, at Oxford, and a feature of the occasion which excited much comment was an address by Sir Daniel Hall, president of the agricultural section, and chief scientific advisor to the British ministry of agriculture, upon the oft-discussed theme of increasing population and the food supply. In view of the non-fulfillment as yet of the theories of Malthus (1798) and the warnings of Sir William Crookes (1898), it might seem that men of science would be cautious about advancing pessimistic views on this subject, but such views continue to be offered from time to time.

The fundamental proposition that population tends to increase in geometrical progression, while the increase in the yield of food from a given area is subject to the law of diminishing returns, is undoubtedly true in a fundamental sense, but it is common experience that good cultivation will produce a crop at lower unit cost than poor cultivation, by reason of a larger yield per acre, and it would seem to be probable that scientific research may enable the farmers to go much farther in the accomplishment of such results. There is always room, however, to question whether future discoveries will fully offset the law of diminishing returns.

Sir Daniel Hall was reported by the London Times, in part, as follows:

After making a number of estimates, he concluded that, under the existing conditions of agriculture among Western peoples, it required between two and two and a half acres of cultivated land to supply the needs of one unit of population (one man, one woman, and one child). The expansion of the white peoples in the last century was unprecedented, but was achieved only because of the vast areas of unoccupied land, chiefly in the Americas, which suddenly had become available for cultivation. There was no similar increase of good land to be expected. A certain gain might be achieved by the introduction of more heavily cropping varieties, but too much was not to be expected from the plant breeder. The present annual increment in the white population was about five millions, which would necessitate the taking into cultivation of twelve million acres of new land every year. \* \* \*

If we are to continue to feed the growing population of the world on the present methods a continued expansion of the cultivated area is required; new land is called for year after year. I cannot see where this new land of the necessary quality is to be found in quantities commensurate with the immediate demand. Doubtless the white races will insist on maintaining their rising standard of living and will apply deliberate checks to their fertility, a process we already see in action. But the restriction of increase

will not take effect all at once, even under economic pressure, and the danger lies in the period preceding the comparative stabilization. As it cannot be supposed that the development of the civilized races can be allowed permanently to be checked by lack of food when food is obtainable, it follows that resort must be had to the intensification of production from the area already under cultivation. The means for that intensification are already in sight; more will be supplied with the advancement of research.

Intensification, however, is in the main attended by a higher cost of production, and movement in that direction is likely to be slow until it is stimulated by a rise of prices. \* \* \*

I hope I have given reasons for supposing that they must rise, because the surge in population set up by the unprecedented extension of the cultivated area last century cannot all at once be checked, whereas the new land still available is either inadequate in amount or unsuited to cheap production by the old methods. Pressure is sooner or later inevitable, and one of the biggest problems before the world at present is to prevent the pressure developing suddenly or becoming unbearable. The intensification of production is the only remedy, and again the only means of rendering intensification practicable is the continued pursuit of scientific research.

The discussion which followed this address indicated considerable dissent as to the probability of actual scarcity within any calculable time, but without controverting the main proposition that as population increases more intensive and scientific cultivation will be necessary. Since the area of the earth's surface is limited, and the temperate zones already are quite densely populated, the truth of this is obvious.

### Artificial Fertilization

Since Malthus wrote his famous essay, the increased supply of food required by the growing populations of Western Europe has been obtained in the main by improvements in the means of transportation, which have made possible the movement of grain from new regions, unoccupied in his time; and by improved machinery of cultivation, which has enabled agricultural workers to cultivate more land and produce more grain per worker. Although the farmers of the United States produce less per acre than the farmers of Europe, they produce much more per man, which under the conditions existing here has been more important. It is evident, however, that in order to meet the demands of the future there will have to be increasing yields per acre.

The virgin soil of this country originally contained the elements required for the farm crops, but both reason and experience teach that continual cropping removes these elements and will gradually reduce the crop yields unless something is done to replenish the exhausted store. It has been long known that stable manure and decomposed animal and vegetable matter, consisting as they do of elements which came from the soil, when applied to it in the form of fertilizer will have the effect of restoring the original productive qualities. Where crops are all fed to animals upon the farms and only the condensed results in the form of animals or animal products are sold away,



the deterioration is much slower than where the crops are sold off to be consumed elsewhere, and on dairy or feeding farms where more of grain and roughage is consumed than grown, the land actually builds up in fertility. On the whole, however, owing to the great consumption of farm products in the towns and cities and the quantities exported, the amount of natural residues returned to the soil is comparatively small, and if fertility is to be maintained the lost elements must be replaced from other sources.

Of the plant constituents which are removed from the soil by cropping, by far the most important are nitrogen, phosphorus and potash. How great is the absorption by the principal farm crops appears by the following table, which we take from an article\* written by F. E. Allison, an expert of the Fixed Nitrogen Research Laboratory of the United States Department of Agriculture, Washington, D. C.

Plant Food Constituents Removed from the Soil by Crops

Crop	Av. Yield per acre 1924	Nitrogen lbs.	Phos- phoric acid, lbs.	Potash lbs.
Corn .....	23 bu.	36.1	12.7	25.4
Wheat .....	16 bu.	27.2	10.6	13.4
Oats .....	36 bu.	34.6	13.0	29.4
Buckwheat....	20 bu.	77.5	13.5	60.5
Potatoes .....	124 bu.	26.0	11.2	37.2
Cotton .....	445 lbs.	68.2	21.2	47.8
Beets .....	17,800 lbs.	44.5	17.3	89.0
Tobacco .....	723 lbs.	42.7	5.6	56.4

\* Journal of Chemical Education, January, 1926.

The phosphorus for fertilizer is obtained in this country from the beds of phosphate rock which exist in Florida, Tennessee and Idaho. In order to render the phosphorus available as plant food it is treated with its own weight of sulphuric acid and the resultant material comes on the market as acid phosphate fertilizer. It constitutes by far the greatest tonnage of any single material now used by the fertilizer industry in this country, although according to the above table it is not the element of the soil most heavily drawn upon by our leading crops.

The potash consumed in this country comes mainly from the German and French mines, home production supplying only a small portion. Our total annual consumption is about 250,000 tons. While our domestic production of potash may be increased it seems likely that we shall be dependent upon European supplies for an indefinite time.

Dr. Allison expresses the opinion that "lack of nitrogen more than any other element is responsible for low crop yields in the United States." It is the element most often lacking and also the most costly element to supply.

Inasmuch as the absence of any one element in due proportion limits crop production to an output conforming to this deficient element, it

is evident that a deficiency of nitrogen will seriously affect crop yields in this country. The Department of Agriculture in a recent publication has made the statement that "the soils of the United States are steadily growing leaner in nitrogen content," and adds:

The agricultural phase of the nitrogen problem is undoubtedly deserving of most emphasis, because here it reaches its widest human interest. What is done with the nitrogen problem in the next ten years will probably determine to a considerable degree whether present American standards of living can be maintained. There seems no escape from the conclusion that unless relatively cheaper fixed nitrogen can be supplied to agriculture, steady decrease in crop production will continue, while our population is increasing rapidly. In the past agricultural production has kept pace with the growth of population, not by increasing the yield per acre but by continually increasing the acreage of cultivation, expanding into the richer soils of the Middle West, and abandoning the poor areas of the East.

#### Nitrogen from Coal

Coal, which in its origin was a vegetable product, carries from  $\frac{1}{2}$  to 2 per cent nitrogen, and when distilled in a by-product coke oven or in the manufacture of gas, the nitrogen combines with a portion of the hydrogen also present, forming ammonia, a gas exuded by stable manure and that has been known as "spirits of hartshorn," from the fact that it has been distilled on a large scale from horns, hoofs and other animal refuse. Treated with sulphuric acid, ammonia is assimilated by plant life, and this sulphate of ammonia is a common fertilizer material. As a by-product of coal its production is determined by the amount of coal distilled for the manufacture of coke and gas, and the price is determined by that of the cheapest commodity with which it must compete, which at present is Chilean nitrate.

The by-product coke ovens are the principal source of ammonia in this country at the present time, and if the conversion of coal into gas for general fuel purposes should increase largely, as scientists in conference at the Carnegie Institute in the past month have predicted, the supply of ammonia will be correspondingly increased and sulphate of ammonia cheapened.

At the recent convention of the American Gas Association at Atlantic City, the prediction was freely made that house-heating was destined to be taken over by the gas industry, and Mr. Robert M. Searle, President of the Rochester Gas and Electric Company, of Rochester, New York, made the statement that his company was planning to spend \$42,000,000 in the next seven years to take on the heating business. Such extension of the gas business means an increasing supply of by-product ammonia, available as nitrogenous fertilizer.

#### Nitrogen from the Air

The principal source of nitrogen for fertilizer until recently has been the natural deposits of crude nitrate salts, called caliche, in Chile.

Of the approximately 1,500,000 tons of nitrogen consumed in the world, about 32 per cent, or 480,000 tons, is now supplied by Chile, 28 per cent, or 420,000 tons is a by-product of the manufacture of coke and gas, and 40 per cent, or 600,000 tons is extracted from the atmosphere by methods comparatively new. These are tons of 2,000 lbs.

The great ultimate source of nitrogen is the atmosphere, which holds an inexhaustible supply, but plant life, although dependent upon nitrogen, is unable to assimilate it directly from the air. Certain plants of the legume family, as peas, beans and clover, develop bacteria which have the faculty of extracting nitrogen from the atmosphere and fixing it in nodules on their roots. Such plants when turned under green have the effect of replenishing the nitrogen content of the soil.

The alarming statement by Sir William Crookes in 1898, touching the future of food supplies, was to the effect that the Chilean nitrate deposits would be exhausted in a comparatively short time, and that unless other sources of nitrogen became available the world would not be able to feed its population.

This sensational utterance stimulated research work among scientists in many countries upon the problem of fixing nitrogen from the atmosphere. In 1902 two American chemists, Bradley and Lovejoy, set up at Niagara Falls what is said to have been the first small apparatus ever built for the definite purpose of artificially fixing atmospheric nitrogen for commercial purposes. It was based upon the principle that when a powerful electric discharge takes place in the air some of the oxygen and nitrogen which previously were only mixed are chemically combined by the intense heat. The oxides of nitrogen so formed are readily convertible into nitric acid or nitrates, available either for explosives or fertilizers. It had been known for a long time that a lightning flash would effect this chemical combination and that small quantities of nitrogen thus formed were washed out of the atmosphere into the soil. This natural phenomena has been the basis of all the investigations.

In the following year experiments began in Norway, which had the advantage of cheaper power, and in 1905, the first commercially successful plant for extracting nitrogen from the atmosphere began operations there and is still running. Air is passed through an electric furnace, effecting a union of oxygen and nitrogen. This process is technically effective, but has the disadvantage of requiring a very large amount of power, to-wit: 67,000 kw.hr. per ton of nitrogen obtained. For this reason the arc process, as it is known, has not had much development outside of Norway.

About the same time the commercial development of the cyanamid process was getting

under way in Germany and Italy. This process also uses an electric furnace, and employs air, water, limestone, coke and coal, with a power consumption less than one-fourth that required by the arc process. Cyanamid is not strictly a fertilizer material, although largely used for that purpose, but has other important uses in the chemical industry. This process developed into use very rapidly. The first commercial plant was operated in 1906 and by 1913 about 15 plants with an estimated capacity of 300,000 metric tons of crude calcium cyanamid—or lime-nitrogen as it is frequently called—were in operation in nine countries, and in 1918 the number of plants in all countries had increased to 36, with a total estimated capacity of 1,625,000 metric tons, or 325,000 metric tons of nitrogen. One of these was U. S. Nitrate Plant No. 2, at Muscle Shoals, Ala., with a capacity of 40,000 tons of nitrogen per year—the largest cyanamid plant in the world.

#### Synthetic Ammonia

Meanwhile what is now known as the Haber process was being developed in Germany. Professor Fritz Haber, of Karlsruhe, working upon the known fact that nitrogen and hydrogen gases when chemically united will produce ammonia, found that this union would take place when these gases were brought together under a certain pressure at a certain temperature and in the presence of certain substances scientifically known as catalysts. Power consumption is very much reduced, but the process at first encountered serious difficulties from the requirement for gas of high purity and the necessity for handling this inflammable gas at high temperatures and high pressures. Fortunately, the process was taken up by the Badische Anilin und Soda-Fabrik, the great corporation of the German chemical and dye industry, and Professor Bosch and his aids were successful in overcoming the technical difficulties. After operating for a short time an experimental plant of a capacity of 5 tons ammonia per day, the Badische erected in 1912 the first economical synthetic ammonia plant with a capacity of 25 tons ammonia per day. This factory, located at Oppau on the Rhine, was put in operation in 1913, and since has been steadily extended so that it now produces about 125,000 tons of nitrogen per year, corresponding to about 625,000 tons sulphate of ammonia. A very large expenditure was made to achieve the first success.

The results obtained at Oppau led to the erection of another nitrogen factory at Merseburg, the so-called Leunawerke, which utilizes the easily exploitable lignite deposits in middle Germany. The Leunawerke has now a capacity of about 365,000 tons nitrogen per year, and it is stated that production will be extended to about 550,000 tons nitrogen per year shortly.

Ammonia, the product of the Haber-Bosch process, is raw material for all the nitrogenous compounds in demand for fertilizers. The works in Oppau and at Leuna consist to a large extent of factories for the conversion of ammonia into the various kinds of fertilizer materials, the number of which is steadily increasing. The processes have been worked out in detail by the Badische company, and in view of the fact that the original patents are now generally available it is probable that these secondary processes are of more practical importance than the ammonia synthesis itself.

The Badische Anilin und Soda-Fabrik is now incorporated in the I. G. Farbenindustrie, the largest corporation in Europe, including practically the entire dye and chemical industry of Germany. It is devoting resources without stint to the fertilizer industry.

#### **The Nitrogen Industry in Germany**

It is admitted that Germany is leading the world in the nitrogen industry, and in cheapening nitrogen for the production of food it is making a contribution for world welfare the value of which will be better appreciated as time passes. It is now producing more nitrogen than Chile, and more than all the by-product coke ovens in the world. The large scale of production is an important factor in reducing costs.

The industry has greatly contributed to improve the financial situation in Germany. Before the war Germany imported Chile nitrates at a value of \$45,000,000. At this time she not only imports none from Chile, but on the contrary exports nitrogen products to the value of about \$37,500,000. Upon this basis a direct money gain for the country is effected of approximately \$82,500,000 per year, not counting the increase in production of agricultural products caused by the more intensive use of cheap nitrogen put at the disposal of agriculture. It is confidently predicted in Germany that the country will soon be relieved of the necessity of importing food supplies.

#### **Modifications of the Haber Process**

The principles of the Haber process have been employed with some modification of method in a number of works outside of Germany. Among the most successful of these is that of the Atmospheric Nitrogen Company of Syracuse, New York, which is affiliated with the Allied Chemical and Dye Corporation. United States Nitrate Plant No. 1, built by the Government at Sheffield, Alabama, during the war, was constructed upon plans supplied by the General Chemical Company for the production of synthetic ammonia. It had not reached the stage of regular operations when the war ended and it has not been put into

operation. The Syracuse plant was planned with small capacity, 10 tons per day, to embody the principles of the Sheffield plant but with some improvements suggested by the tests made there, and is said to have yielded very satisfactory results. Actual production for some time has been more than double the nominal capacity.

The powder industry is interested in the production of nitrogen and the duPonts have a subsidiary company, "Lazote, Inc.," located at Charleston, West Virginia, which is understood to be operating successfully, and to have plans for expansion.

The American Cyanamid Company, which has its principal works in Canada at Niagara Falls, produces calcium cyanamid which, while available for fertilizer, is in the main consumed in the manufacture of various products in the chemical industries. This company planned and built the Government Cyanamid plant at Muscle Shoals, and is in the forefront of this branch of the industry. In view of the position which it has held in the development of the industry it may be assumed that it will continue to be an important factor in it.

#### **The Government Research Laboratory**

At the close of the war the United States Government, which had expended large sums at Sheffield, Muscle Shoals and other places, in preparing for the production of nitrogen from the atmosphere, established the Fixed Nitrogen Research Laboratory in the Department of Agriculture, for continued investigation of the subject. This policy would seem to be justified by the large investment which the Government already has made and in view of the importance of the developing industry. The cyanamid plant at Muscle Shoals, including the dam, auxiliary steam plant and village for employes, has cost \$111,500,000 and the Sheffield ammonia plant about \$13,000,000, making a total investment of \$124,500,000.

#### **An Important New Industry**

We have been prompted to give this condensed account of the development to date of this new nitrogen industry by the promise which it offers of coming importance. Professor Shimer, of the Massachusetts Institute of Technology, is quoted as saying that "man has passed through the stone age, the bronze age and the iron age and is now in the nitrogen age."

The new industry is exciting interest all over the world. Scientific men everywhere are attacking its problems, and it is altogether probable that further important developments are to come.

#### **The Use of Fertilizers**

The use of fertilizers naturally has been much more common and intensive in Europe



than in this country, not only because our lands are comparatively new in tillage but because the European farms are small, labor is cheap and there is need to obtain the largest possible production per acre. According to the latest available figures the consumption of fertilizer in the United Kingdom is about 178 pounds per acre for all land in cultivation and in Germany about 200 pounds. The latter figure is for 1920, while in 1913 consumption in Germany was 280 pounds. In 1920 the consumption of Belgium was 513 pounds per acre in cultivation and in Holland 674 pounds. In Italy and France, however the consumption was only about 50 pounds to every acre in cultivation.

The high mark in the consumption of fertilizers in the United States was touched in 1920, when the amount consumed was 7,609,000 tons. On account of the decline in prices of farm products consumption fell off in the following years, but the tonnage in 1925 was 7,464,000, which slightly exceeds that of 1913. The consumption has shown an increase of about 8 per cent per annum over normal years. The heaviest use of fertilizers is for cotton. In 1924 the Department of Agriculture collected a large amount of data upon the cost of growing cotton and the results of using fertilizer, which has been published in Department Circular 340, and from which we have taken the following figures showing results:

USE OF FERTILIZERS IN PRODUCTION OF COTTON, 1924

YIELD (pounds of lint per acre)	No. of Reports	Yield per acre (pounds of lint)	Total cost exclusive of rent	Fertilizer and manure per acre	Per cent of total cost	Value of product (lint and seed) per acre	Net return per acre
60 pounds and under....	24	36	\$16.27	\$1.73	10.6	\$ 9.79	\$ 6.48
61 to 100 pounds.....	107	93	23.87	3.52	14.7	24.52	.65
101 to 140 ".....	186	125	24.23	3.12	12.9	32.71	8.48
141 to 180 ".....	284	161	28.11	3.74	13.3	41.85	13.74
181 to 220 ".....	221	200	32.65	4.80	14.7	52.59	19.94
221 to 260 ".....	288	246	34.00	4.82	14.2	64.39	30.39
261 to 300 ".....	156	293	39.11	6.81	17.4	77.07	37.96
301 to 340 ".....	39	324	40.09	6.95	17.0	85.55	45.44
341 to 380 ".....	46	361	43.69	7.45	17.0	94.75	51.06
381 to 420 ".....	60	400	43.29	7.06	16.3	102.55	59.26
421 to 460 ".....	21	448	48.64	9.40	19.3	115.40	66.76
461 to 500 ".....	33	493	47.00	7.43	15.8	126.09	79.09
501 pounds and over.....	6	637	51.98	5.73	11.0	167.50	115.52

Aside from the fertilizer, the principal increase in costs was in harvesting and marketing, but it is very likely the case that the class of farmers who fertilize largely also give the best cultivation. It will be observed that the net returns per acre correspond generally with the expenditure for fertilizer.

#### The Argument for Fertilizer

The argument for fertilizer is precisely the same as the argument for high-bred dairy cows. Up to a certain yield of butter fat a dairy cow is simply a "boarder" who does not pay her keep; above that yield she is a money-maker. Moreover, even cows of the highest breeding will not produce good yields without

proper and ample feeding. So with an acre of land under crop: the labor of planting and cultivating is not necessarily greater where the soil contains an abundance of plant food than where it does not; if elements of plant nutrition are deficient the returns may hardly pay for the labor expended, while if these are abundant the returns may be ample.

The Ohio Extension Service recently used the books of 28 Scioto County farmers for five years, to show that "yields-to-the-acre and the quantity and kind of live stock kept had more to do with profit and loss than any other factors." The five best paying farms averaged for the five years period, five bushels of corn, three bushels of wheat, and 600 pounds of hay per acre more than the other 23 farms. Whatever was grown on the farm, it paid and paid well to feed properly and liberally. The report says:

Not greater total production but greater production to the acre, or the cow, or the hen, was what made profits. It cost about as much to feed a poor cow, or hen, or to work a poor acre, and the per unit cost of the product in this case often ran so high as to exclude profit at present prices.

#### Striking Testimonials

Some of the testimony for the use of fertilizers is very remarkable. Mr. B. L. Moss, farming 1400 acres of land at Soso, Mississippi, and 3000 acres in Midland County, Texas, a graduate of the Mississippi State Agricultural College, and for several years state leader of

county agents in that state, in a recent letter says that he began using commercial fertilizers on cotton in 1917 at a time when the boll weevil had cut production in his locality to about 10 per cent of the former yield, and by increasing applications he had raised his production to a bale of lint per acre on his entire acreage in cotton. His letter concluded with the following paragraph:

Of all the factors that have contributed to the defeat of the boll weevil and the restoration of confidence and prosperity to a pest-stricken Cotton Belt, I place the use of nitrate of soda first. It has restored confidence where confidence had been lost; it has brought confidence where it did not exist. It has taken the hazards out of boll weevil cotton farming, and made cotton production as safe and certain a

business as it was before the weevil came. Personally, it has been indispensable to me, and I never expect to try to raise cotton without it. And what it has done for me, I am sure it will do for every other cotton farmer similarly situated. It is the best cotton crop insurance I have ever known or heard of.

H. A. McPherson, county agent for Haywood county, Tennessee, has given a statement in which he says that in 1924 fifty-three boys were enrolled in a cotton club under his supervision, and each furnished with 100 lbs. of nitrate of soda and 200 lbs. of acid phosphate, to be used under instructions in cultivating cotton upon one acre of land. Forty-three completed the season, with an average production of 515 lbs. of lint cotton. In 1925, 104 boys completed the season and made an average of 531 lbs. per acre, at a cost of 6.7 cents per lb.

The Chambers of Commerce of Texas have been agitating for several years with the slogan, "More cotton from fewer acres." The Dallas News has conducted a series of prize contests with very interesting results. In 1925 the five high yields in this contest, all grown upon five acre tracts, with costs of production, are reported as follows:

- G. Mont Adams, Grand Prize Winner,  
8081 pounds, cost 5 cents per pound;
- J. W. McFarlane, 7885 pounds,  
cost 6 cents per pound;
- Claude Nash, 7835 pounds,  
cost 4 cents per pound;
- Mrs. F. O. Masten, 4530 pounds,  
cost 5 cents per pound;
- E. C. May, 6178 pounds,  
cost 3 cents per pound.

The significant feature of this showing is not that two or three bales can be grown to the acre, but that production at this rate can be made at costs far below the present average. This shows that the statement quoted from Sir Daniel Hall, that intensification of cultivation is usually attended with higher costs, is subject to important qualification. The Dallas News certifies to the costs in these cases and that they include allowances for rent and depreciation.

The average production of cotton per acre in the United States in 1925 was 167.2 pounds per acre and for the five years 1921-25, 144.2 pounds. A bale weighs 500 pounds.

#### The Danger of Overproduction

Very naturally the comment will be made that since there appears to be an over-supply of farm products at the present time, an increased use of fertilizers and consequent increase of production will be likely to bring about still lower prices, thus passing the benefits on to consumers and perhaps causing actual glut and waste. Professor Falconer, Agricultural Economist, Ohio State University, has replied to this objection as follows:

Inefficiency in production is no cure for low prices. Experience and research have shown that farmers with high yields make greater profits than their neighbors with low yields. On high-priced land high yields are more economical to produce than low yields. If a reduction in output of a particular crop

seems desirable, it would be better to reduce the acreage or for individual farmers to abandon the crop entirely than to reduce the yields.

Apparently, a great economy would be accomplished by reducing the acreage in cotton and increasing the efficiency of cultivation, but doubtless it is true that if all farmers were to suddenly begin to produce at a much higher rate there might be some difficulty in readjusting farming operations to suit the new situation. On the other hand, although the prospects are that commercial fertilizers are destined to be cheaper in the future, it is to be considered that great numbers of people do not change their accustomed methods very rapidly. The use of fertilizers is by no means new and it is probable that the farmers most receptive to the arguments for their use are already using them to some extent. This being so, their increasing use may be expected to come gradually, and without a crisis, but educational work upon the subject is in order.

#### Economic Conditions Will Govern

The foregoing naturally suggests the fundamental difficulty which besets all plans for arbitrarily regulating either the production or prices of farm products. The reports of the Department of Agriculture indicate that the tendency in this country has been to increasing yields of farm products with fewer people on the farms, but, instead of being accepted as significant of economic gains, this is often referred to as something deplorable. Obviously the work of the agricultural colleges and United States experiment stations, the labors of the county agents, to whose support the United States Government contributes, and the expenditure upon the new Fixed Nitrogen Research Laboratory are all for the purpose of accomplishing greater production at lower unit costs. Undoubtedly the policy is sound and in the general interest, but it may have some degree of responsibility for the very conditions in agriculture which just now are the subject of general agitation.

It may be that more effective organization among the farmers is necessary to enable them to deal effectually with changing and uncertain conditions and to establish orderly production, but it is evident that a mere policy of price maintenance, with or without government aid, will be unable to prevent continual pressure upon the farmers who do not adopt the best methods. The most economical practices are bound gradually to force themselves into use, for the individuals who adopt them and find them profitable naturally will extend their operations, thus increasing production and causing prices to tend downward, while those who do not adopt them gradually shift to other occupations. This is the history of progress in all lines, and one of the conditions to which men must adjust themselves in a competitive and progressive society.

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